International Standard 4082

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Road vehicles — Motor vehicles — Flasher units

Véhicules routiers — Automobiles — Centrales clignotantes

First edition — 1981-07-15

UDC 629.113.066 **Ref. No. ISO 4082-1981 (E)**

Descriptors : road vehicles, motor vehicles, flasher units, electric terminals, position finding, electrical properties, vibration tests, impact tests, routine tests, testing conditions, frequency of operation, electric power.

Price based on 7 pages
Preisgr. E

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4082 was developed by Technical Committee ISO/TC 22, *Road vehicles*, and was circulated to the member bodies in July 1979.

It has been approved by the member bodies of the following countries :

Australia	Japan	Spain
Austria	Korea, Dem. P. Rep. of	Sweden
Belgium	Korea, Rep. of	Switzerland
France	Netherlands	United Kingdom
Germany, F.R.	Romania	
Italy	South Africa, Rep. of	

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Canada
Czechoslovakia

Printed in Switzerland

Road vehicles — Motor vehicles — Flasher units

1 Scope

This International Standard defines the electrical characteristics with which flasher units for motor vehicles shall comply when submitted for acceptance.

2 Field of application

This International Standard applies to flashers intended for use on motor vehicles (term 3.1 of ISO 3833) with 12 V or 24 V systems, which may or may not be equipped for a towed vehicle (term 3.2 of ISO 3833).

It can be applied to motorcycles.

It is not applicable to two-level luminous intensity devices.

There are two classes for both 12 V and 24 V systems :

— **Class A** : Standard applications;

— **Class B** : Heavy duty applications.

3 References

ISO 303, *Road vehicles — Installation of lighting and light signalling devices.*[1)]

ISO 3833, *Road vehicles — Types — Terms and definitions.*

4 General

4.1 Inscriptions

Each flasher shall bear, clearly legibly and indelibly, the trade name or mark of the manufacturer, the rated voltage, and the identification numbers of the terminals provided according to table 1, and also the wattages of the lamps for which the flasher is designed.

Table 1 — Identification of the flasher unit terminal

Identification number of the terminals[1)]	Allocation
1	Current supply
2	To the turn signal switch
3	To the pilot lamp 2
4	Common return
5	To the pilot lamp 1
6	To the pilot lamp 3
7	"Off" circuit of the operational tell-tale
8	Return from the turn signal switch, left side
9	Return from the turn signal switch, right side
10[2)]	To the left direction indicator lights (motor vehicle)
11[2)]	To the right direction indicator lights (motor vehicle)
12	To the left direction indicator lights (towed vehicle)
13	To the right direction indicator lights (towed vehicle)
14	To the left supplementary side direction indicators on the motor vehicle and/or the towed vehicle
15	To the right supplementary side direction indicators on the motor vehicle and/or towed vehicle
16	To the turn signal switch, auxiliary circuit for the towed vehicle

1) Other terminal identifications are allowed.

2) When front and rear direction indicator lights of a motor vehicle are individually connected to the flasher, the corresponding terminals shall each have the same identification number.

1) At present at the stage of draft. (Revision of ISO/R 303-1963.)

4.2 Functions

The functions of the flashers may be the following :

4.2.1 Flasher exclusively for direction indicator lights.

4.2.2 Flasher exclusively for hazard warning signalling.

4.2.3 Combined flasher for direction indicator lights and for hazard warning signalling.

4.3 Conditions of application

The conditions of application may be the following :

4.3.1 Motor vehicle not equipped with devices to draw towed vehicles.

4.3.2 Motor vehicle equipped with devices for drawing one towed vehicle only.

4.3.3 Motor vehicle equipped with devices for drawing two towed vehicles.

4.3.4 Motor vehicle equipped with devices for drawing only one towed vehicle, with two-circuit flasher.

4.3.5 Motor vehicle equipped with devices for drawing two towed vehicles, with two-circuit flasher.

5 Electrical characteristics

5.1 Working voltage

The working voltage is the voltage existing between points D and E of the test circuit according to 5.3, the flasher being short-circuited.

5.2 General test conditions

If not otherwise specified, the flasher shall be tested in a room having an ambient temperature of 23 ± 5 °C, at a working voltage of 13 V or 26 V.

The flashers shall be tested in the position (or positions) indicated by the manufacturer.

5.3 Test circuitry and equipment

5.3.1 Wiring diagram

The resistances in the circuitry shall have the values indicated in the wiring diagram shown in figure 1. The resistances of the cables and the ammeter are included in the resistances indicated in the wiring diagram. To check these resistances, the flasher and the filament lamps shall be short-circuited by two shunts with a resistance not exceeding 0,005 Ω each.

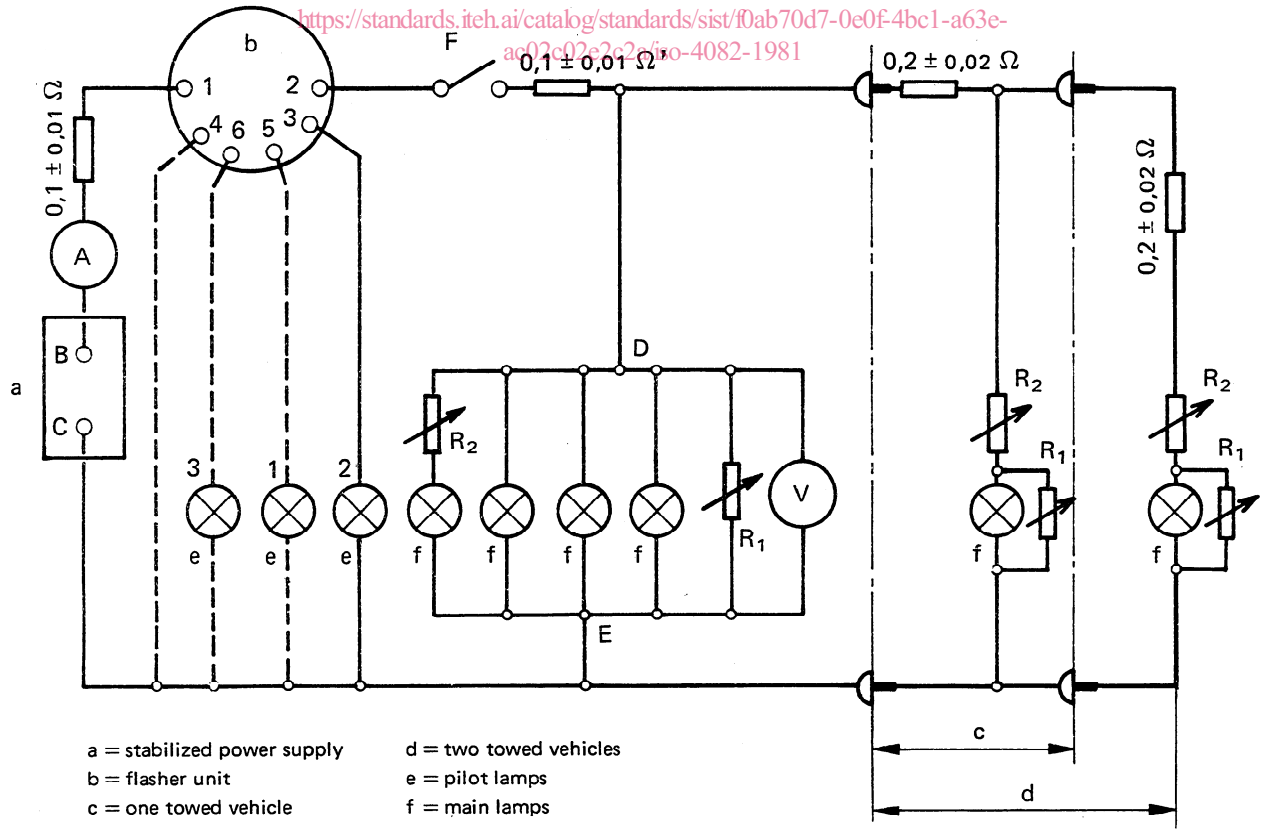

Figure 1 — Wiring diagram for the testing of flashers
(example for a flasher with one pilot circuit)

5.3.2 Filament lamps

Only filament lamps according a forthcoming IEC Publication shall be used. This does not apply to the pilot lamps when they are not connected in parallel to the main lamps.

5.3.3 Measuring equipment

The measuring equipment used to measure the flashing frequency, the "on"-time, the starting time, and the voltage drop in the flasher, shall not disturb the circuit.

5.3.4 Tests

The stabilized power supply used for the measurements shall comply with the following requirements :

5.3.4.1 For all tests, except for the test conducted according to 5.16 :

— the stabilized power supply shall be capable of supplying the steady load current continuously and the inrush current, necessary for the tests;

— the voltage between B and C (see figure 1) shall not deviate by more than 1,0 V when the load is raised from 0 to the maximum value (inrush current included). The voltage variation shall not exceed 370 mV after 100 µs;

— static regulation : the voltage between B and C (see figure 1) shall not deviate by more than 2 % with changes in static load from 0 to the maximum stabilized value (not including inrush current), or for static input line voltage variations;

— ripple voltage : maximum 75 mV, peak to peak.

5.3.4.2 For the durability test (see 5.16) :

— voltage between B and C (see figure 1) 14 V or 28 V and 13 V or 26 V according to the mode of use of the flasher (see 5.16.1 and 5.16.2);

— the voltage between B and C (see figure 1) shall not deviate by more than 1,0 V when the load is raised from 0 to the maximum load (inrush current included); the voltage variation shall not exceed 370 mV after 10 ms;

— static regulation : the voltage between B and C (see figure 1) shall not deviate by more than 2 % with changes in static load from 0 to the maximum load (not including inrush current), or for static input line voltage variations;

— ripple voltage : maximum 300 mV, peak to peak.

5.4 Adjustments

The voltage at the terminals D and E of the filament lamps shall be adjusted to 13,5 V or 28,0 V after the flasher has been short-circuited by a shunt according to 5.3.1.

The lamps used for the tests shall be selected so that the sum of the wattages does not deviate by more than + 2 % and − 6 % from the sum of the corresponding mean wattage values at 13,5 V or 28 V.

The current to obtain the electrical load of the motor vehicle and, if applicable, of the towed vehicle (or towed vehicles) shall be adjusted to a precision of 0,5 % of the sum of the corresponding mean wattage values at test voltage according to the IEC Publication, by adjusting one of the trimmer resistors R_1 or R_2, the other being neutralized. The filament lamps for the auxiliary side direction indicators, when applicable, shall be included. The filament lamps of the pilot indicators shall also be included when they are connected in parallel to the main lamps. The adjustments shall be made individually for each (simulated) vehicle.

For the tests, the power supply shall be so adjusted to obtain the voltages specified at the terminals D and E at the different test temperatures without re-adjustment of the trimming resistors R_1 or R_2.

5.4.1 The "operating" tell-tales shall be provided and connected in the test circuit as indicated by the manufacturer.

5.4.2 In the case of functioning for hazard warning signals, an additional filament lamp shall be provided corresponding to the pilot lamp for the hazard warning signal according to the indications of the manufacturer.

5.5 Starting time

5.5.1 By convention, the following terms apply :

— beginning of the current "on"-time is the moment when, starting from a voltage equal to or less than 3 V (or 6 V), the working voltage reaches 11 V (or 22 V).

— beginning of the current "off"-time is the moment when, starting from a voltage equal to or exceeding 11 V (or 22 V), the working voltage reaches 3 V (or 6 V).

5.5.2 The beginning of the first current "on"-time shall be within not more than 1,0 s after having closed the switch F at a working voltage of 13 V or 26 V, adjusted before.

5.5.3 The period of time for the first current "on"-time shall be at least 0,2 s.

5.5.4 The beginning of the first current "off"-time shall be within not more than 1,5 s after having closed the switch F at a working voltage of 13 V or 26 V, previously adjusted.

5.5.5 The requirements of 5.5.2, 5.5.3 and 5.5.4 shall be complied with on the basis of an average of three starts which shall be separated by a cooling interval of at least 5 min. The same requirement shall be complied with for one start only after 5 min continuous operation.

5.6 Frequency and current "on"-time

5.6.1 Frequency

5.6.1.1 Functioning for direction indicator signals

With the lowest and the highest electrical load (i.e. for the smallest and the greatest number of lamps for which the flasher involved is designed), the flash rate shall comply with the indications of table 2 when, after at least five consecutive cycles, the mean value of at least three consecutive cycles is determined.

Table 2 — Flashing frequency for flashers functioning as direction indicator signals

Working voltage V		Stabilized temperature °C	Flash rate cycles/min
24,0	12,0	− 18 ± 2,5	60 to 120
30,0	15,0	− 18 ± 2,5	
22,0	11,0	+ 52 ± 2,5	
28,0	14,0	+ 52 ± 2,5	
26,0	13,0	+ 23 ± 5	

Measurements shall be taken after 2 h stabilization at the specified temperatures. The time of operation at the temperature of − 18 °C shall not exceed 15 s. At the temperature of + 52 °C, measurements shall be taken after 5 ± 1 min of continuous operation.

5.6.1.2 Functioning for hazard warning signals

With the lowest and the highest electrical load, the flash rate shall comply with the values of table 3 when, after at least five consecutive cycles, the mean value of at least three consecutive cycles is determined.

Table 3 — Flashing frequency for flashers functioning as hazard warning signals

Working voltage V		Stabilized temperature after 2 h °C	Flash rate cycles/min
22,0 and 26,0	11,0 and 13,0	− 18 ± 2,5 + 23 ± 5 + 52 ± 2,5	60 to 120

5.6.2 Current "on"-time

The current "on"-time (ratio, as a percentage, of the current "on"-time over one cycle) shall be measured after at least five consecutive cycles by determining the mean value of at least three consecutive cycles under the conditions of temperature and voltage defined in 5.6.1.1 and 5.6.1.2.

Under the conditions mentioned above, the current "on"-time shall remain between 30 % and 75 %.

5.7 Operational tell-tale for direction indicator signals

5.7.1 Normal conditions (all lamps operating)

When all lamps are operating normally, the audible and/or optical operational tell-tale(s) shall operate, at the rate of the main filament lamps, in phase or counterphase, at temperatures of − 18 ± 2,5 °C, + 23 ± 5 °C and + 52 ± 2,5 °C, and in the range of working voltage between 11 V and 14 V or between 22 V and 28 V. The tell-tale(s) do not need to function when the hazard warning signal function is switched on.

The tests shall be carried out under conditions where the sum of the wattages of the main lamps, of the lamps for the auxiliary side direction indicators (when applicable), and of the pilot indicator lamps (when they are connected in parallel to the main lamps), corresponds to the indications of table 4.

Table 4 — Lamp load for operational tell-tale test
(all lamps operating)

Flasher intended for use with W	Deviation of the sum of the wattages of the filament lamps from the mean values at 13,5 V or 28 V %
1 × 21	− 5 to − 6
2 × 21	− 5 to − 6
3 × 21	− 3 to − 4
4 × 21	− 2 to − 3

These wattages are obtained by lamp selection.

This test shall be carried out according to the principles as defined in 5.4, but without the resistors R_1 and R_2.

5.7.2 Indication of a filament lamp failure

In the case of a failure of a main filament lamp at temperatures of − 18 ± 2,5 °C, + 23 ± 5 °C and + 52 ± 2,5 °C and in the range of working voltages between 11 V and 14 V or between 22 V and 28 V, the audible and/or optical operational tell-tale(s) shall indicate this failure either by ceasing to function, or by a change of frequency as defined as follows :

a) in the case of a frequency increase, the resulting frequency shall exceed by at least 75 % the frequency existing originally under the same conditions; it shall, however, be at least 140 cycles/min.

b) in the case of a frequency decrease, such a decrease shall be at least 50 % of the frequency existing originally under the same conditions, the resulting frequency shall, however, not exceed 50 cycles/min.

In the case of a lamp, it is considered that it ceases to function when it remains either extinguished or lit.

The main filament lamp (or lamps) remaining operable shall continue to flash with a flash rate between 40 and 250 cycles/min, but at 13 V or 26 V only.

The tests shall be carried out under conditions where the sum of the wattages of the lamps which are still operable, the lamps for the auxiliary side direction indicators (when applicable), and the lamps for the pilot indicators (when they are connected in parallel to the main lamps), correspond to the indications of table 5.

These wattages are obtained by lamp selection.

This test shall be carried out according to the principles as defined in 5.4, but without the resistors R_1 and R_2.

Table 5 — Lamp load for operational tell-tale test
(one main lamp failed)

Flasher intended for use with W	Deviation of the sum of the wattages of the filament lamps from the mean values at 13,5 V or 28 V %
1 × 21	not applicable
2 × 21	+ 5 to + 6
3 × 21	+ 5 to + 6
4 × 21	+ 3 to + 4

5.8 Voltage drop

The measurements shall be carried out after at least five complete cycles of functioning. The flasher being fed with 13 V, the smallest voltage drop measured between the input terminal and the output terminal considered shall not exceed 0,4 V (0,45 V for three or more main filament lamps) when operating for "direction indicating" and 0,5 V (0,6 V for more than four main filament lamps) when operating for "hazard warning signalling".

The flasher being fed with 26 V, the smallest voltage drop measured between the input terminal and the output terminal considered shall not exceed 0,8 V when operating for "direction indicating" and 1,0 V when operating for "hazard warning signalling".

5.9 Dielectric strength

When new and in an ambient air relative humidity of 45 to 75 %, the flasher shall be capable of withstanding for 1 min a voltage of 1 000 V r.m.s. with a frequency of 50 Hz or 60 Hz between the terminals and the exterior metallic parts (mounting brackets, housing, rivets), if these parts are not electrically connected to one of the terminals.

This test is not required where such exterior metallic parts do not exist or if an electrical connection exists as mentioned above.

5.10 Transient overvoltage strength

An International Standard on electromagnetic compatibility is under preparation.

5.11 Overload strength

With a voltage of 13 V or 26 V, the flasher shall be capable of resisting a maximum current of 25 A once only for 10 s between the input terminal and the output terminal considered (pilot lamp circuits excepted).

Before the test, the flasher terminals considered shall be shunted by 5 mΩ max. With the resistor R_3, the current shall be adjusted to 25 A[1] (see figure 2).

Then, the shunt shall be removed for the test.

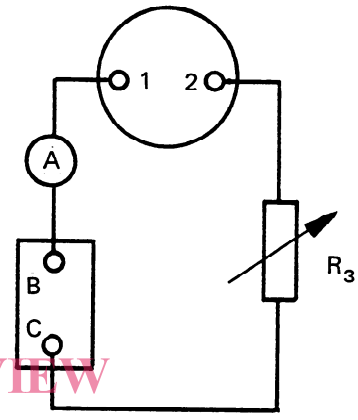

Figure 2 — Wiring diagram for the overload strength testing

5.12 Vibration test

The flasher shall be mounted on a test bench in the position and with the method of mounting corresponding to the mounting on the vehicle. The test shall be carried out at an ambient temperature of 23 ± 5 °C.

5.12.1 Operational tell-tale

With sinusoidal vibrations between

— 20 and 50 Hz with an acceleration amplitude of 30 m/s^2 for class A flashers,

— 20 and 200 Hz with an acceleration amplitude of 50 m/s^2 for class B flashers,

the flash rates of the main filament lamps shall comply with the specifications of 5.6.1. However, this test is only required at a temperature of 23 ± 5 °C.

Furthermore, the operational tell-tales shall not cease functioning. Momentary frequency variations with respect to the main filament lamps are, however, allowed.

This test shall be carried out successively according to the three axes.

1) This value will be increased to 35 A from the first of January 1981.

5.12.2 Endurance vibration test

The flasher, not connected to the power supply, shall be subjected to sinusoidal vibrations varying from

— 20 to 50 Hz and from 50 to 20 Hz within 1 min with an acceleration amplitude of 50 m/s^2 for class A flashers,

— 20 to 200 Hz and from 200 to 20 Hz with a frequency variation of 2 octaves/min and with an acceleration amplitude of 50 m/s^2 for class B flashers.

After 45 h of test, equally divided between the three main axes, the flasher shall not have deteriorated and shall still comply with the conditions specified in 5.5 and 5.6. Furthermore, the tell-tales shall still be operable.

5.13 Impact test

5.13.1 Test conditions

At an ambient temperature of 23 ± 5 °C, the flasher shall be suspended at the end of a wire of 500 mm length, the other end of which shall be fixed. The fixing point shall be in the plane of a vertical face of a steel block of mass 25 kg. The wire shall be moved to make an angle of 60° with the vertical in a plane perpendicular to the corresponding steel block surface. The flasher shall then be released to strike the block.

This test shall be carried out in both directions of each of the three main axes. One test only shall be conducted on each sample.

5.13.2 Specifications after the test

After at least 3 min operating as direction indicator, or as hazard warning if the flasher is designed for this function only, the flashers tested shall comply with the requirements of 5.5, 5.6 and 5.7 at the temperature of 23 ± 5 °C; furthermore, the frequency shall not have varied, due to the impact, by more than 12 cycles/min.

However, if the variation is more than 12 cycles/min, the impact test shall be repeated five times. After which, it is sufficient that the flashers tested comply with the requirements of 5.6.1 at the temperature of 23 ± 5 °C.

5.14 Resistance to heat and cold

The flasher shall withstand :

— a temperature of 40 ± 3 °C at a relative humidity of 90 to 95 % for 48 h;

— a temperature of + 80 °C for 1 h;

— a temperature of − 40 °C for 3 h.

These tests shall be conducted without any electrical connection.

At the end of each of these three tests, which shall not be cumulative, and after having been cooled to an ambient temperature of 23 ± 5 °C, the flasher shall be subjected to the tests specified in 5.5, 5.6, 5.7 and 5.8 and shall comply with the relevant conditions.

5.15 Functioning at extreme temperatures

Supplied with a working voltage of 12,0 V or 24,0 V, the flasher shall still give flashing pulses at the extreme temperatures of − 30 °C and + 80 °C. The starting time, the "on"-time, and the indication of the operational tell-tale of the direction indicator lights shall not be checked in this test; however, the flashing frequency shall be between 30 and 250 cycles/min. The operational time for this test shall not exceed 1 min.

5.16 Endurance

The flasher shall be connected as indicated in 5.3, but without trimming resistors.

5.16.1 Functioning for "direction indicating"

The circuit shall be fed with 14 V or 28 V (measured at the terminals of the power supply), and flashers shall be subjected to the following tests, but one of the tests only is to be conducted on each sample :

5.16.1.1 For class A flashers :

— 200 h of working cycles consisting of 15 s "on" and 15 s "off";

— 100 h of continuous operation.

5.16.1.2 For class B flashers :

— 1 000 h of continuous operation; for flashers with two circuits, the test shall be carried out with working cycles consisting of 30 s left side and 30 s right side operations.

5.16.2 Functioning for "hazard warning signalling"

The flasher shall be subjected to an endurance test in continuous operation for 36 h for class A and for 72 h for class B with the maximum load indicated by the manufacturer. This test shall be conducted at a voltage of 13 V or 26 V, measured at the terminals of the power supply.

5.16.3 Test sequence

For combined flashers, the test according to 5.16.1 shall be conducted first, followed by the test according to 5.16.2.

5.16.4 Tests after endurance

After a minimum rest time of 1 h, the flasher shall be subjected to the tests specified in 5.5, 5.6 and 5.7 and shall comply with the relevant specifications. Moreover, two out of eight samples tested in accordance with the requirements of 5.8 shall be allowed to exceed the maximum voltage drop specified in 5.8 by a margin of 20 %.

6 Number of samples and sequence of the individual tests

The number of samples shall be 20.

Initially, all samples shall comply with the specifications of 5.5 to 5.8. Subsequently, the scheme of applying the tests to the different samples according to 5.9 to 5.16 shall be as shown in table 6.

Table 6 — Individual tests

	1	2	3	4	5	6	7		8	9
Sample No.	5.9 Dielectric strength	5.15 Extreme tempera-tures	5.11 Overload	5.14 Heat and cold	5.13 Impact	5.12 Vibration	5.16.1.1(A) Endurance		5.16.1.2(B) Endurance direction indication	5.16.2 Endurance hazard warning
							200 h	100 h		
1	X	X	X							
2	X	X	X							
3				X	X					
4				X	X					
5				X	X					
6				X	X					
7				X	X					
8				X	X					
9						X				
10						X				
11						X				
12						X				
13							X		X	X
14							X		X	X
15							X		X	X
16							X		X	X
17								X	X	X
18								X	X	X
19								X	X	X
20								X	X	X

(A) = Class A flashers

(B) = Class B flashers